

JES DIABLO PRINTERFACE MISCELLANEOUS INFORMATION

LAST UPDATE : 22/03/87

DEFINITION OF SYSTEM

MEMORY MAP:

0000H-1FFFH 2 * 2732 4K EPROM (1*8K): SYSTEM SOFTWARE
8000H-BFFFH 2 * 6264 8K STATIC RAM: BUFFER AND SCRATCH
4000H-401FH MEMORY MAPPED I/O: SEE BELOW

TIMING LOOPS ARE BASED ON A CLOCK FREQUENCY OF 1.536 MC.(2.2MC.)

4000H-400BH: DIABLO PRINTER CONTROL PORTS:

4000H: OUTPUT

BIT 0 : DATA 1
BIT 1 : DATA 2
BIT 2 : DATA 4
BIT 3 : DATA 8
BIT 4 : DATA 16
BIT 5 : DATA 32
BIT 6 : DATA 64
BIT 7 : DATA 128

4004H: OUTPUT

BIT 0 : DATA 256
BIT 1 : DATA 512
BIT 2 : DATA 1024
BIT 3 : RESTORE. LOW ACTIVE
BIT 4 : PRINTER WHEEL STROBE. ACTIVE ON NEGATIVE TRANSITION
BIT 5 : CARRIAGE STROBE. ACTIVE ON NEGATIVE TRANSITION
BIT 6 : PAPER FEED STROBE. ACTIVE ON NEGATIVE TRANSITION
BIT 7 : RIBBON LIFT

4008H: INPUT

BIT 0 : PRINTER READY. LOW INDICATES PRINTER READY
BIT 1 : CHECK. LOW INDICATES INVALID CARRIAGE POSITIONING.
BIT 2 : PAPER OUT. CURRENTLY NOT USED
BIT 3 : PRINTER WHEEL READY. LOW INDICATES READY FOR CHAR. COM.
BIT 4 : CARRIAGE READY. LOW INDICATES READY FOR CAR. MOVE COM.
BIT 5 : PAPER FEED READY. LOW INDICATES READY FOR FEED COMMAND.
BIT 6 : CURRENTLY NOT USED.
BIT 7 : CURRENTLY NOT USED.

4010H-8013H: PPI FOR KEYBOARD, SWITCHES AND LEDS:

4010H: SWITCH INPUT (MODE 0)

BIT 0 : DUPL
BIT 1 : LOCAL/LINE (0=LOCAL)
BIT 2 : HOP, DEFAULT WIDTH & HEIGHT
BIT 3 : VTO, DISPLAY FEED ENABLE SWITCH
BIT 4 : NOT USED
BIT 5 : S1, MODE SWITCH
BIT 6 : ALF
BIT 7 : TTY

4011H: KEYBOARD DATA INPUT PORT (MODE 1)

4012H: BIT 0 : HIGH INDICATES CHARACTER IN KEYBOARD BUFFER
BIT 1 : HIGH INDICATES KEYBOARD BUFFER FULL
BIT 2 : INT: INTEB, EXT: KEYBOARD STROBE
BIT 4 : BEEP OUTPUT LINE
BIT 5 : RD LED OUTPUT
BIT 6 : KBE LED OUTPUT
BIT 7 : CD LED OUTPUT

4013H: PPI CONTROL PORT

4014H-4017H: HOST INPUT PPI

4014H: PARALLEL DATA REGISTER

4016H: STATUS REGISTER
BIT 3 : HIGH WHEN CHARACTER PENDING IN INPUT BUFFER

4017H: PPI CONTROL REGISTER

Diablo interface cable definition

Diablo side	Interf. side	Type I/O	Definition
h	HH	I	Data 1
j	JJ	I	Data 2
m	MM	I	Data 4
f	FF	I	Data 8
k	KK	I	Data 16
i	EE	I	Data 32
q	NN	I	Data 64
d	DD	I	Data 128
b	BB	I	Data 256
V	V	I	Data 512
F	LL	I	Data 1024
E	E	I	Restore
P	P	I	Printer wheel strobe
K	K	I	Carriage strobe
C	C	I	Paper feed strobe
S	S	I	Select printer
H	H	I	Select ready
M	M	I	Ribbon lift
a	AA	O	Printer ready
B	B	O	Check
R	R	O	Paper out
Y	Y	O	Print wheel ready
W	W	O	Carriage ready
c	CC	O	Paper feed ready
L	F	O	External reset
Z	-		Not used
C	-		Not used
A	A		Ground
D	D		Ground
J	J		Ground
N	N		Ground
T	T		Ground
U	U		Ground
X	X		Ground

**** Bes Diablo printer interface manual ****

Version 1.2

(C) 1983 Bes company

Summary

The here described interface enhances the Diablo model 1200 HyType I printer with the "intelligence" needed to use it either as a smart printer, or as a stand alone typewriter. These separate functions are called "modes". The first allows several options to be set, which influence the actual printing, but does not limit the operation to "downwards" printing, and direct keyboard input should not be used. In the second mode, entered characters are directly printed, operation as a typewriter. Allowed are reverse linefeeds. But this mode does not support paging, pagenumbering, pagetiteling etc. The communication to the host computer is parallel which allows fast receiving of characters into the interface's buffer.

Control characters.

The following control characters are supported:

Mode 1:

7/07H Produce audible signal.
10/0AH ALF off: linefeed.
ALF on: carriage return, linefeed.
11/0BH Unconditional pagefeed.
12/0CH Conditional pagefeed.
13/0DH ALF off: carriage return.
ALF on: carriage return, linefeed.
14/0EH Ribbon up
15/0FH Ribbon down
27/1BH Escape: start option command.

Mode 2:

2/02H Clear tabs.
3/03H Clear margins.
7/07H Produce audible signal.
8/08H Backspace.
9/09H Do tab.
10/0AH ALF off: linefeed.
ALF on: carriage return, linefeed.
13/0DH ALF off: carriage return.
ALF on: carriage return, linefeed.
14/0EH Ribbon up.
15/0FH Ribbon down.
17/11H Set tab.
18/12H Clear tab.
19/13H Set left margin.
20/14H Set right margin.
24/18H Backspace.
25/19H Advance.
26/1AH Linefeed.
28/1CH Carriage return.
29/1DH Inverse linefeed.

Programmable options

Several useful options can be set using option commands. These

commands are preceded by the ascii code for escape. In mode 1, and with option E=Y specified, the character sequence '(*)' is also recognized as an escape. Leading characters on the line are ignored. Option commands are not printed, except when they contain syntax errors. The message 'BAD PARAMETER(S)' emphasises the error. Currently the following commands are implemented:

A=Y/N Up arrow handling control. A=Y causes the ascii character 5BH to be replaced by the character 7CH, overstriked by the character 5EH, which result for most characterwheels in a quite good replacement for an up arrow. A=N does not change the character 5BH. Default is A=N.

B=Y/N Bidirection printing control. B=N disables bidirectional printing. Default is B=Y. (Mode 1 only)

C=XXX Set characters/line. Valid range is 1-~~258~~⁷⁸⁰. When exceeding this number of characters, the rest of the line is printed on the next line. Default is C=138.

D=Y/N Double strike control. D=Y causes every character to be printed twice, causing a more dark character. This slows down printing significantly. Default is D=N.

E=Y/N Escape sequence recognition flag. E=Y enables the sequence '(*)' to be recognized as an escape. Default is E=Y. (Mode 1 only)

H=XXX Set lines between pages. Valid range is 0-20. Default is H=6. (Mode 1 only)

L=XXX Set lines/page. Valid range is 0-200. L=0 disables paging. Default is L=0. (Mode 1 only)

N New page command. This command should not be followed by any other option, because the rest of the command is ignored. (Mode 1 only)

P=N/XXX Set page-numbering. P=N disables page numbering, P=XXX sets pagenumbers with first page number XXX. The pagenumbers are printed at the upper right top of the page. Pagenumbers are only enabled when the following conditions are met:
- At least 3 lines/page
- At least 10 characters/line
If, after interpreting the rest of the command, the printer is at the top of a page, the pagenumbers are printed immediately. You can force the printer to do this by including a 'L=XXX' command, which resets the linecounter.
Valid range is 0-65529. Default is P=N. (Mode 1 only)

Q=XXX Set steps/line. Valid range is 1-255. The default value depends on the letterwheel size switch HOP: switch up sets Q=7, down to Q=8.

R Reset all options to their default values. This command overrules all leading commands. The R option has the same effect as specifying:
A=N, B=Y, C=138, D=N, E=Y, H=6, L=0, P=N, S=Y, T=' ', X=N, Z=Y
The default values for W and Q depends on the letterwheel size switch HOP: switch up: W=5, Q=7, down: W=6, Q=8.

S=Y/N Lowercase enable flag. S=N disables printing of lowercase characters. Default is S=Y.

T='TITLE' Page title specification. The string between the single quotes is printed at the top of every page. If Pagenumbers are specified, the pagenumbers appear on the same line. The title line is followed by an empty line. T=' ' disables titling. Titling is only enabled when the following conditions are met:

- At least 3 lines/page
- At least 10 characters/line

If, after interpreting the rest of the command, the printer is at the top of a page, the titleline is printed immediately. You can force this by including a 'L=XXX' command, which resets the linecounter.

Valid stringlength range: 0-80 characters. Default is T=''. (Mode 1 only)

V This command produces a software copyright notice, and the version number of the resident interface program. Any characters following this command are ignored, and the escape sequence is terminated.

W=XXX Set steps/character. Valid range is 1-255. The default value depends on the letterwheel size switch HQP: switch up sets W=5, down to W=6.

X=Y/N Set individual sheet flag. When paper is feed to a new page and the option X=Y is specified, the printer produces an audible signal, and wait for CAR RET to be pressed on its keyboard before continuing printing, in order to allow the operator to enter a new sheet. Default is X=N. (Mode 1 only)

Z=Y/N Set zero-slashing. Z=Y causes the character '0' to be printed as the character '0' overstriked with the character '/'. Default is Z=Y.

* Optional command line terminator. All trailing characters on the line are skipped.

Both upper and lowercase characters are accepted. Spaces are ignored, except in the T command titlestring. Options not valid under the specified mode are not assumed to be in error. Switching modes does not alter any options set, causing only those options not valid under the new mode to be disabled temporary.

Switches

As this intelligent interface has most options software programmable, not all switches provided on the diablo keyboard are supported. Those who are, are described below:

Line/Local This switch determines the source of input for the diablo. Line-mode restricts input to host only, local to keyboard only. Therefore, this switch can be used to stop printing of host output temporarily. No data from the host is lost during local mode.

Reset Pressing this switch causes the whole system to be reset to the same state as during powering-up. Use this switch only after fatal errors, and to flush the hostbuffer.

HQP The default lettersize depends on the position of this switch. Up for 15 char/inch, down for 12 char/inch. This switch is only sensed during powering-up, and reset, and has no effect afterwards.

ALF Automatic linefeed switch. When up, a linefeed (0AH) is inserted after every carriage return (0DH).

VTO Display feed option switch. When up, the diablo automatically feeds the paper up 16 steps when no characters are entered in the last 3 seconds. This allows the operator to see what is printed last.

S1

Mode switch. Up sets the system in mode 2, the typewriter mode. Down to mode 1, the intelligent printer mode.

Indication leds

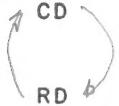
All four indication leds are supported:

Power On whenever the system is operating

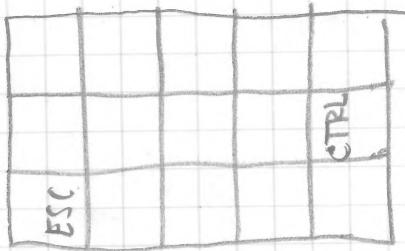
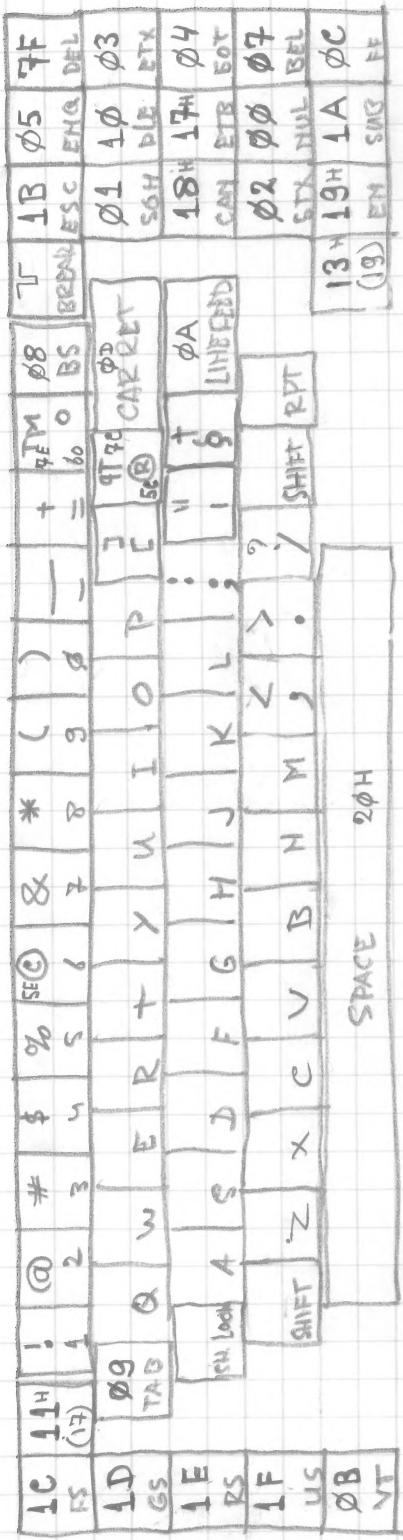
KBE Keyboard enable led. Keyboard entries are possible whenever this led is on

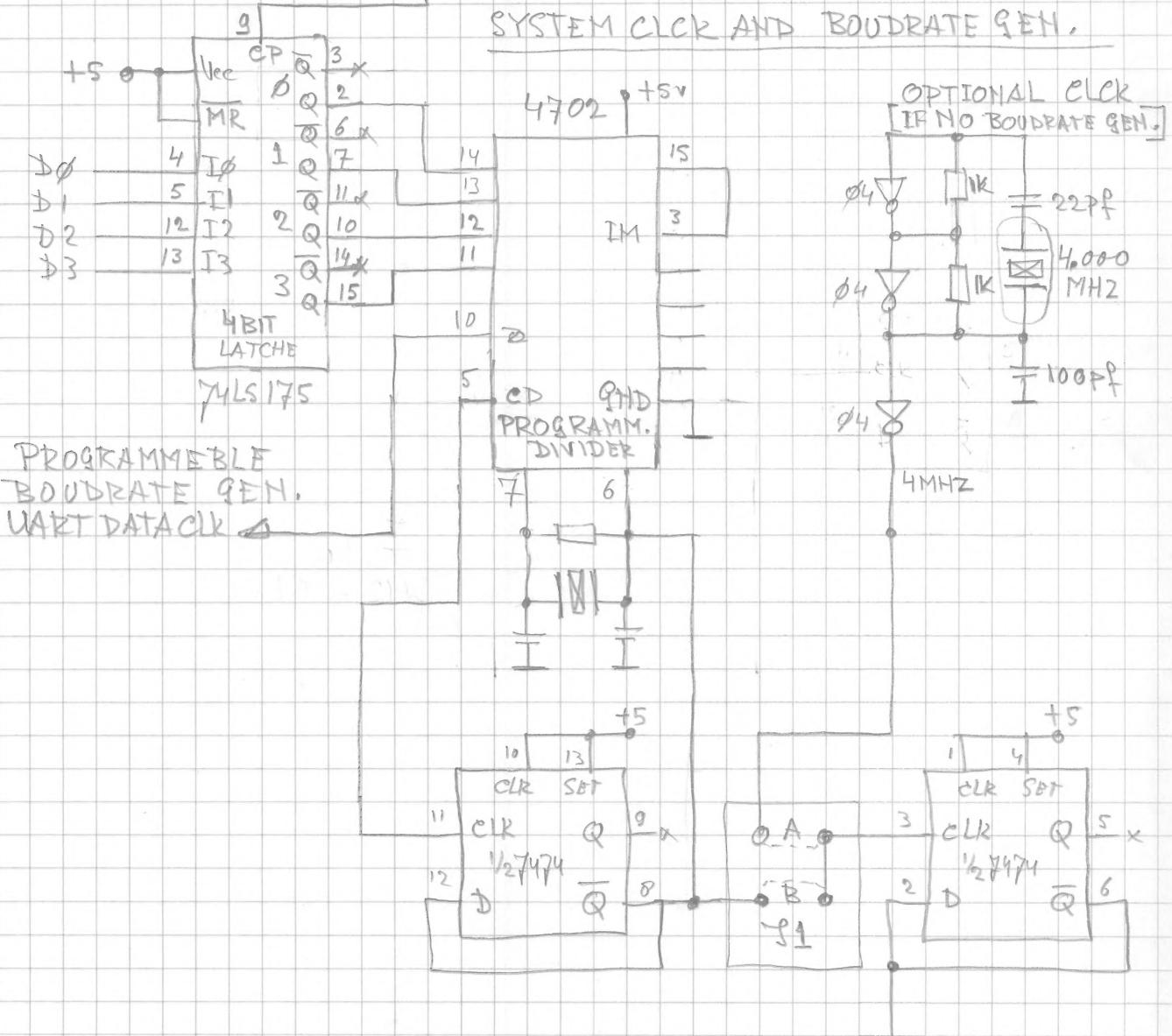
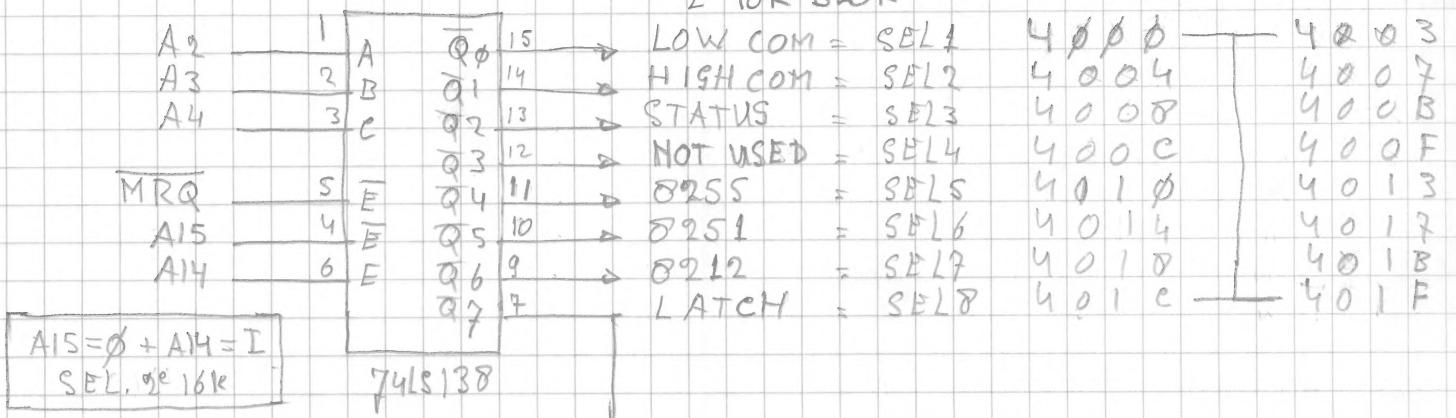
CD Is on whenever the host buffer contains character to print.

RD Is on when the host input buffer is full.



DIABLO KEYBOARD

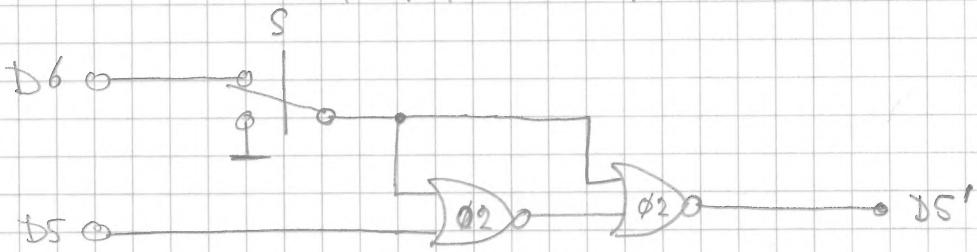




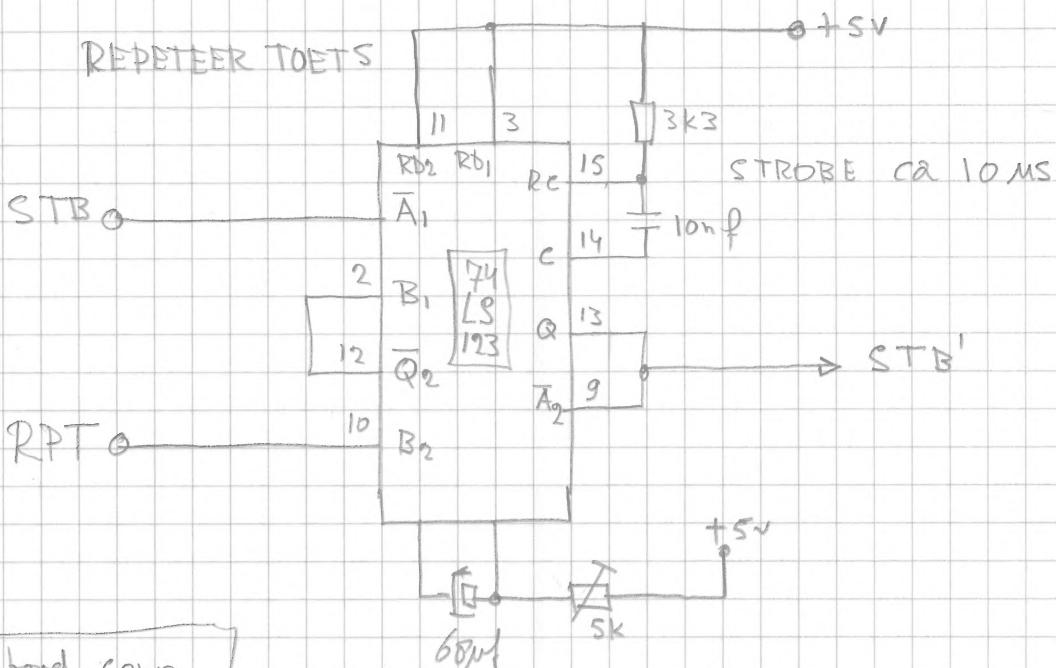
74A22MHz SYSTEM CLK

PA B = ... MHz SYSTEM CLK
AND UART DATA CLK

ALFA LOCK



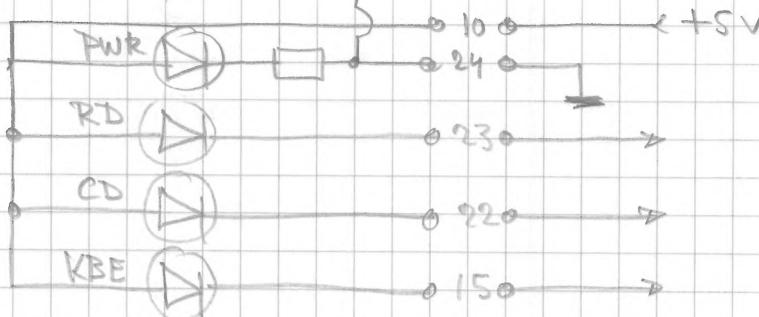
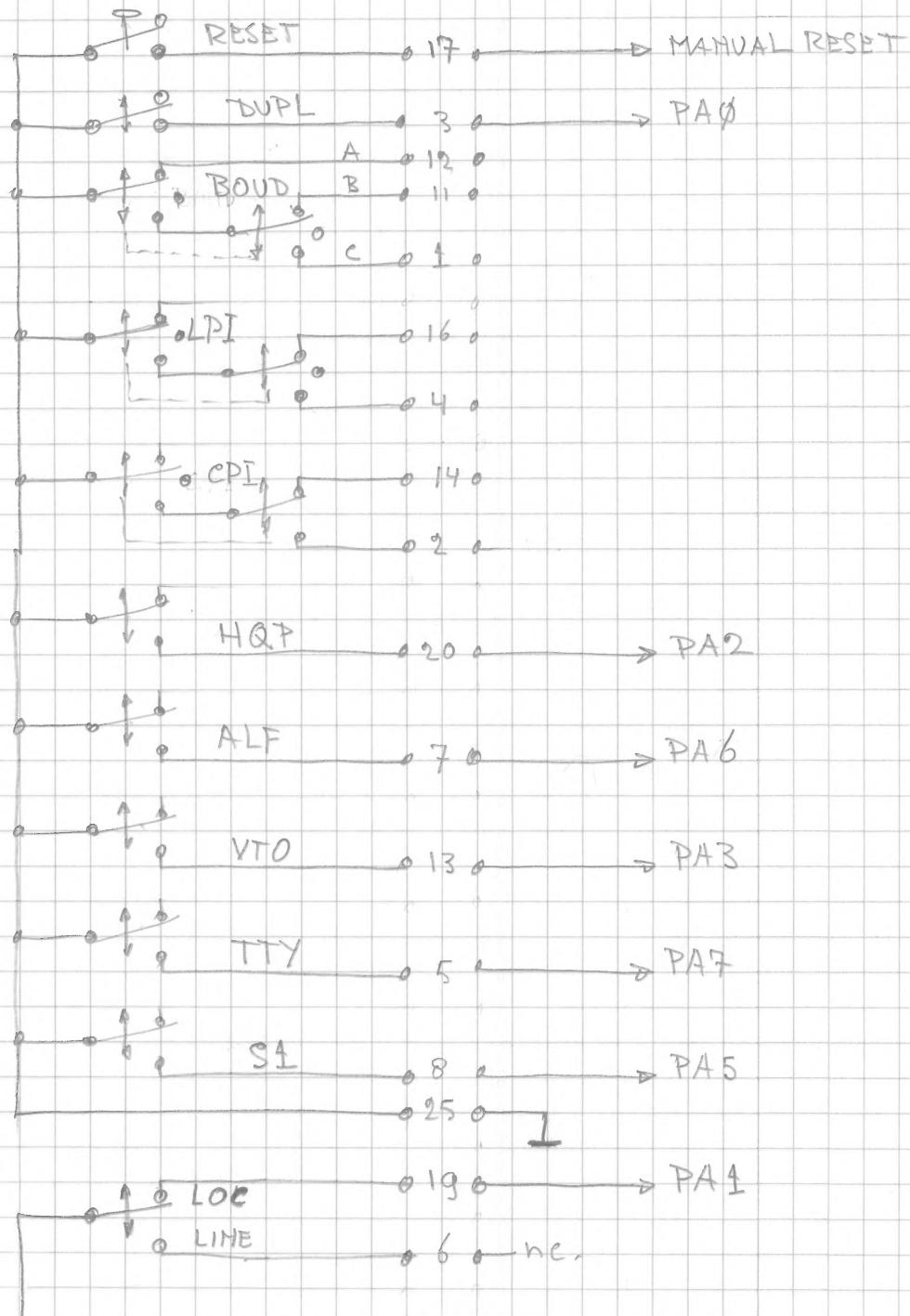
REPETEER TOETS



Toetsaansluiting conn.

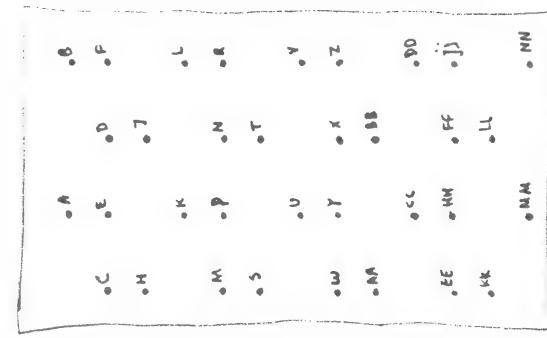
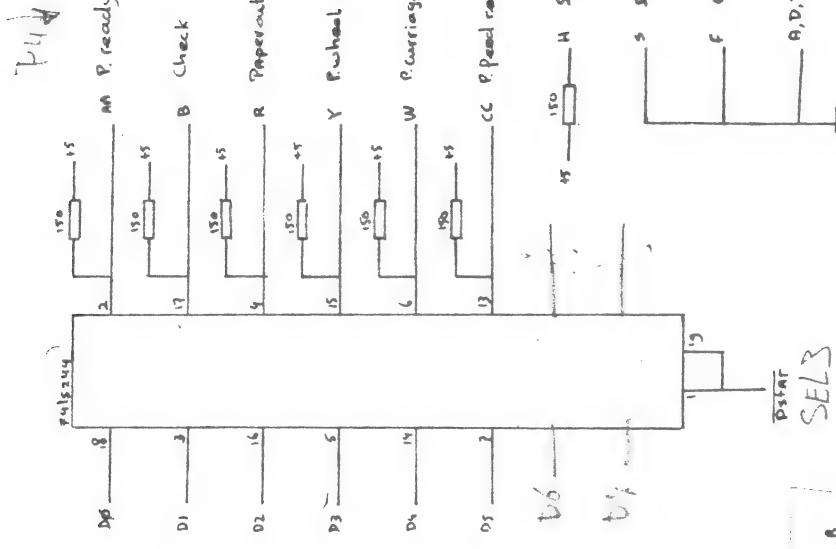
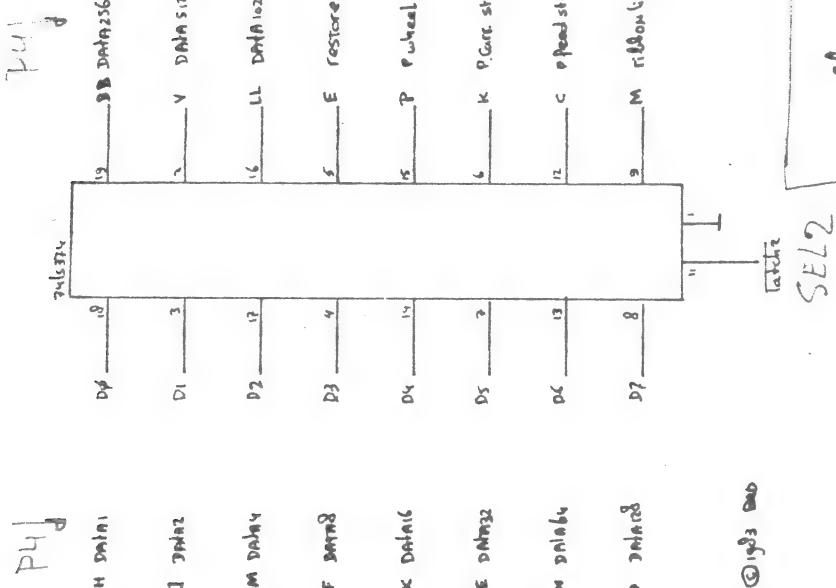
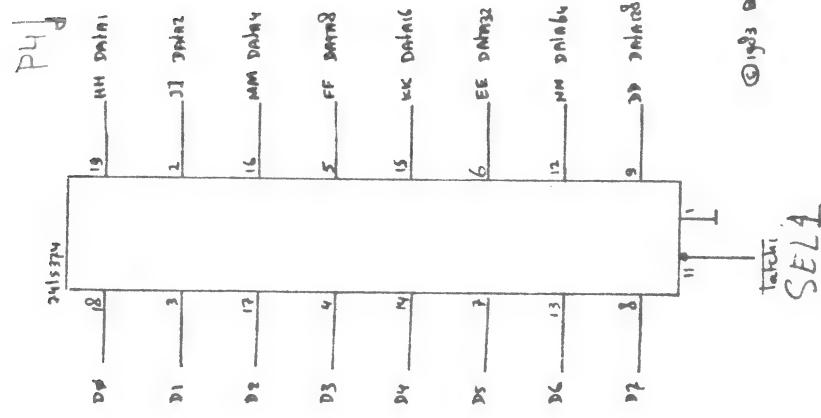
2	+ 5
3	- 12
6	D ₀
7	D ₁
8	D ₂
9	D ₃
10	D ₆ →
11	D ₄
14	STB →
15	D ₅ →
16	RPT →
17	GND
18	GND
19	GND

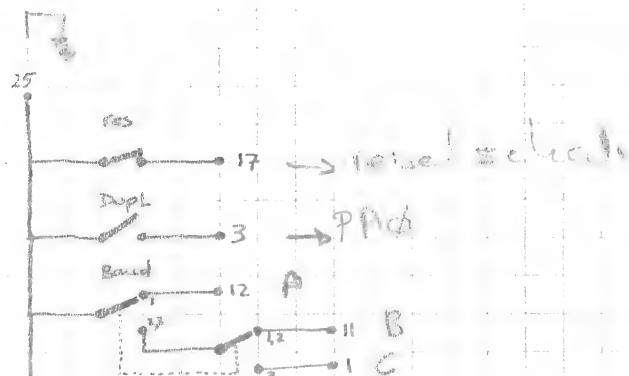
REPETEER SLEUFD



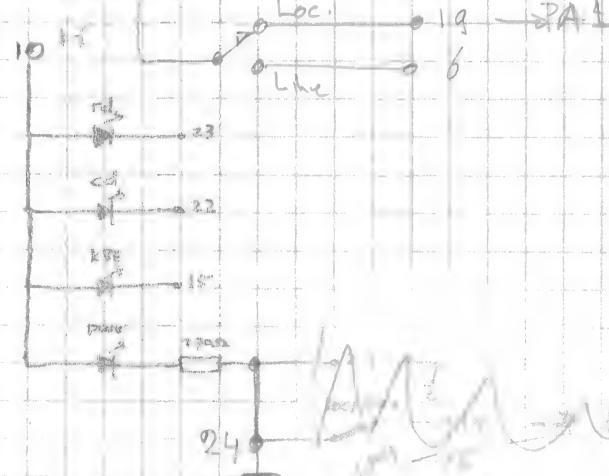
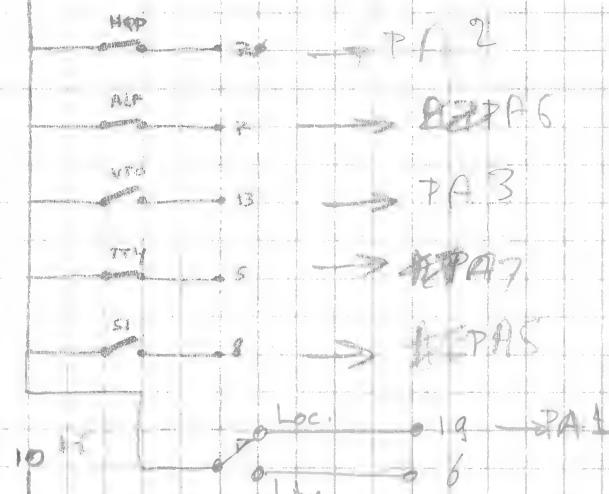
I/O LATCHES + CONTROL, ETC.,

INPUT 300

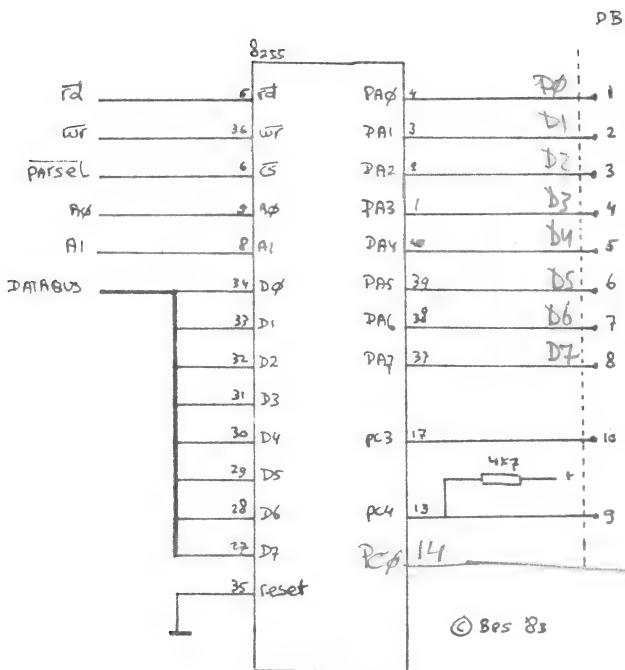




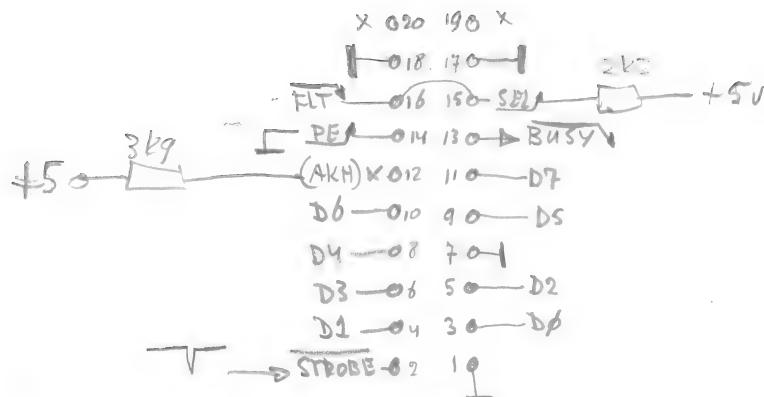
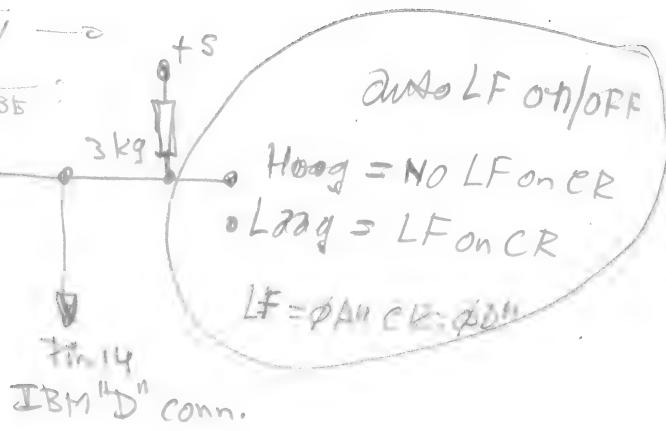
CDE (bad switch!
doet het helemaal niet meer)



raise!
select

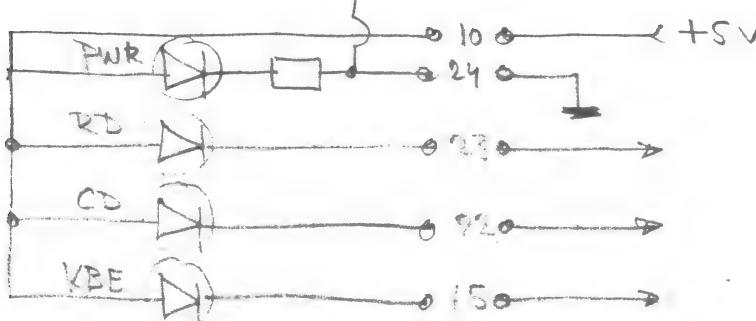
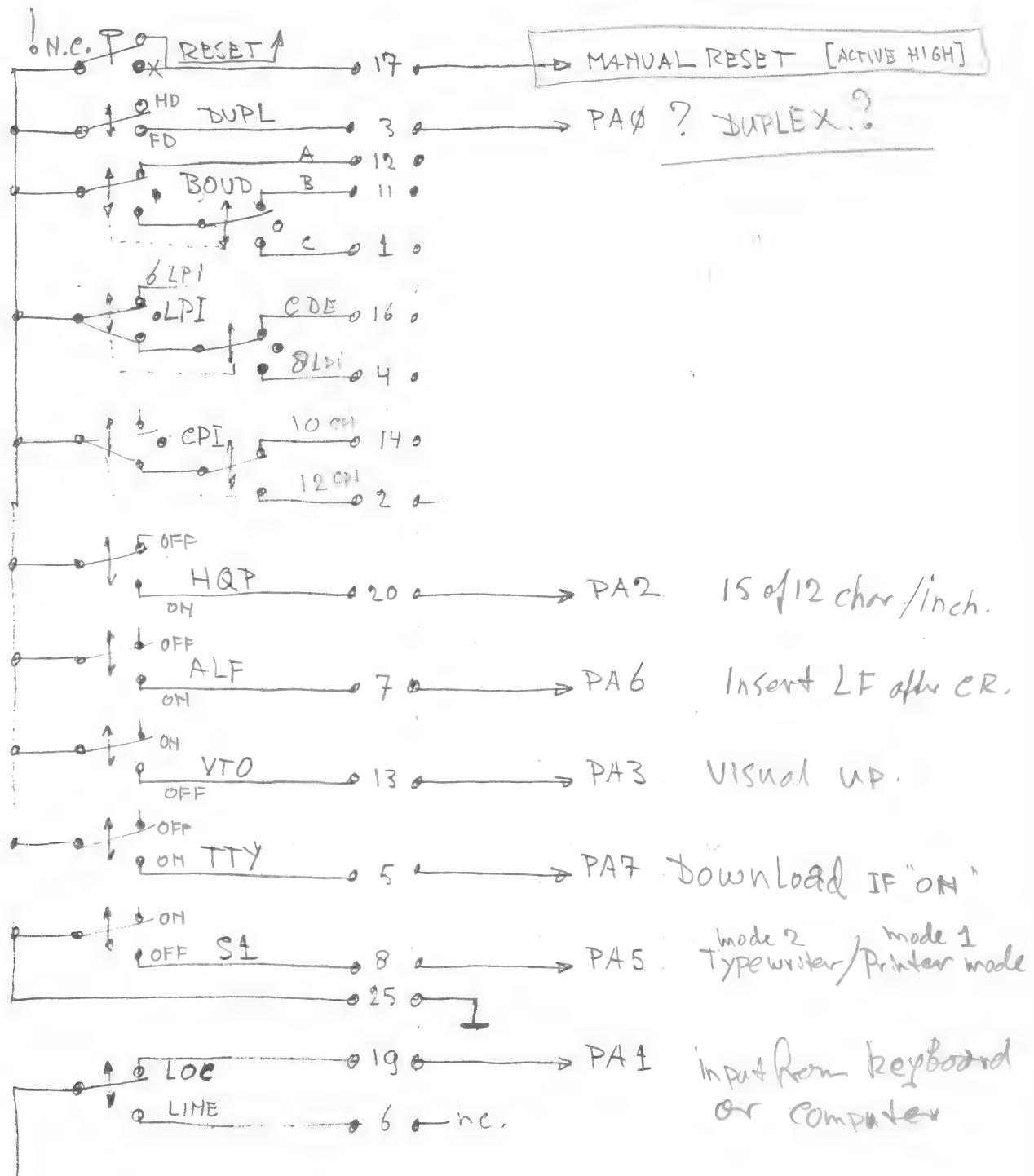


Power: qnd to 7, vcc to 26

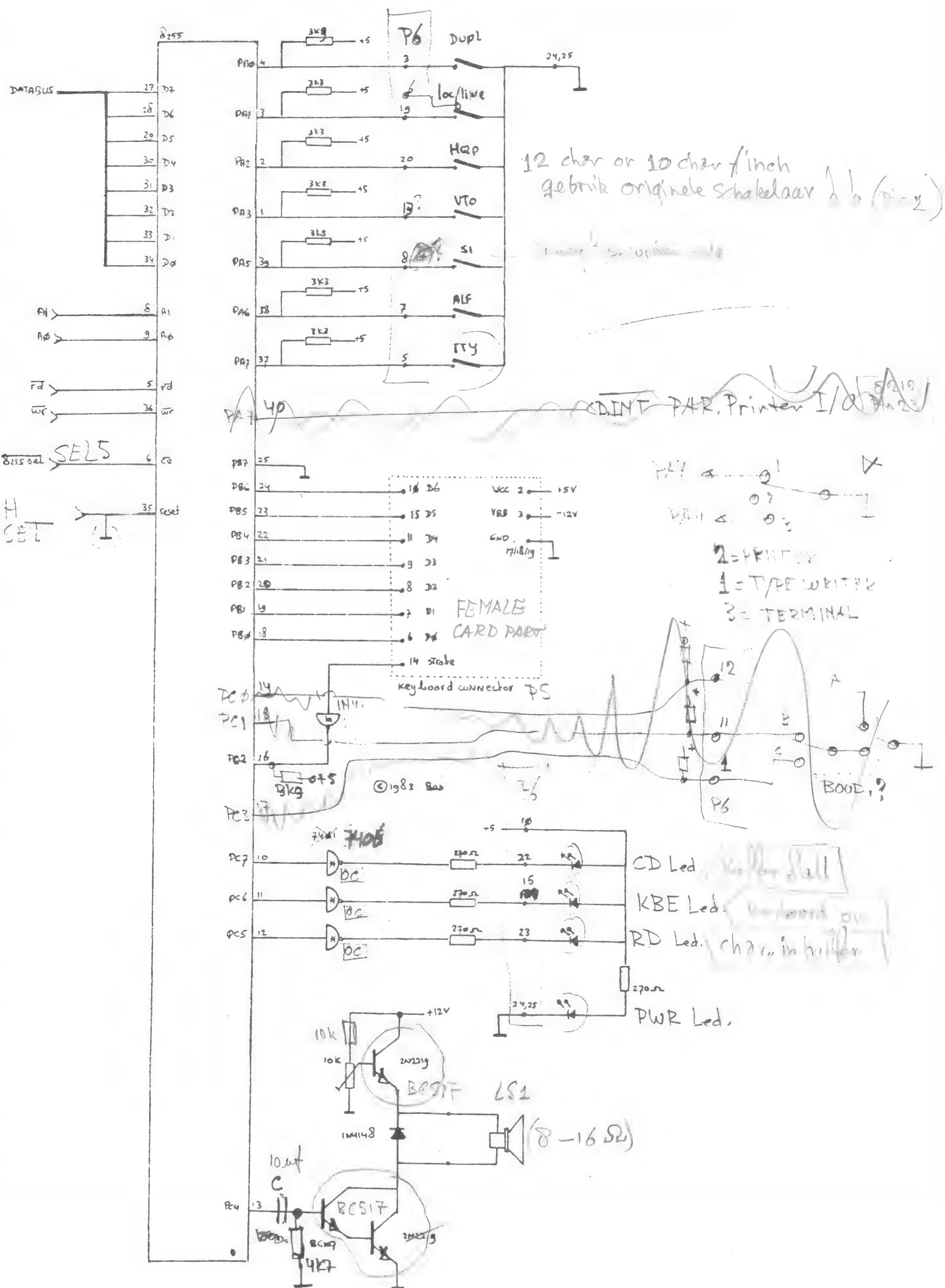


HCT 300

SWITCH CABLE P6 FEMALE

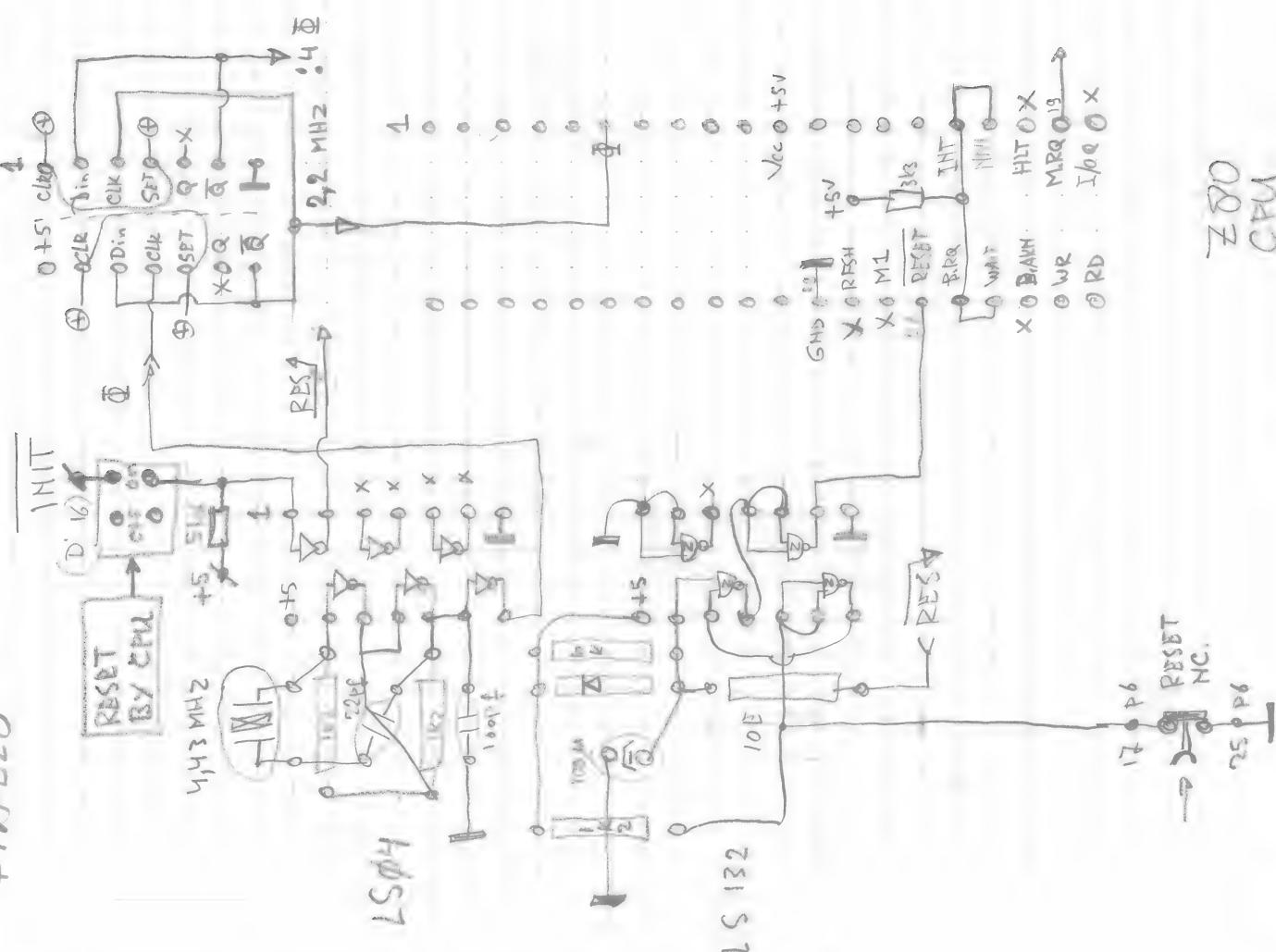


CONTROL I/O HCT 300



SOLVED 2 YDBE

PIA B20

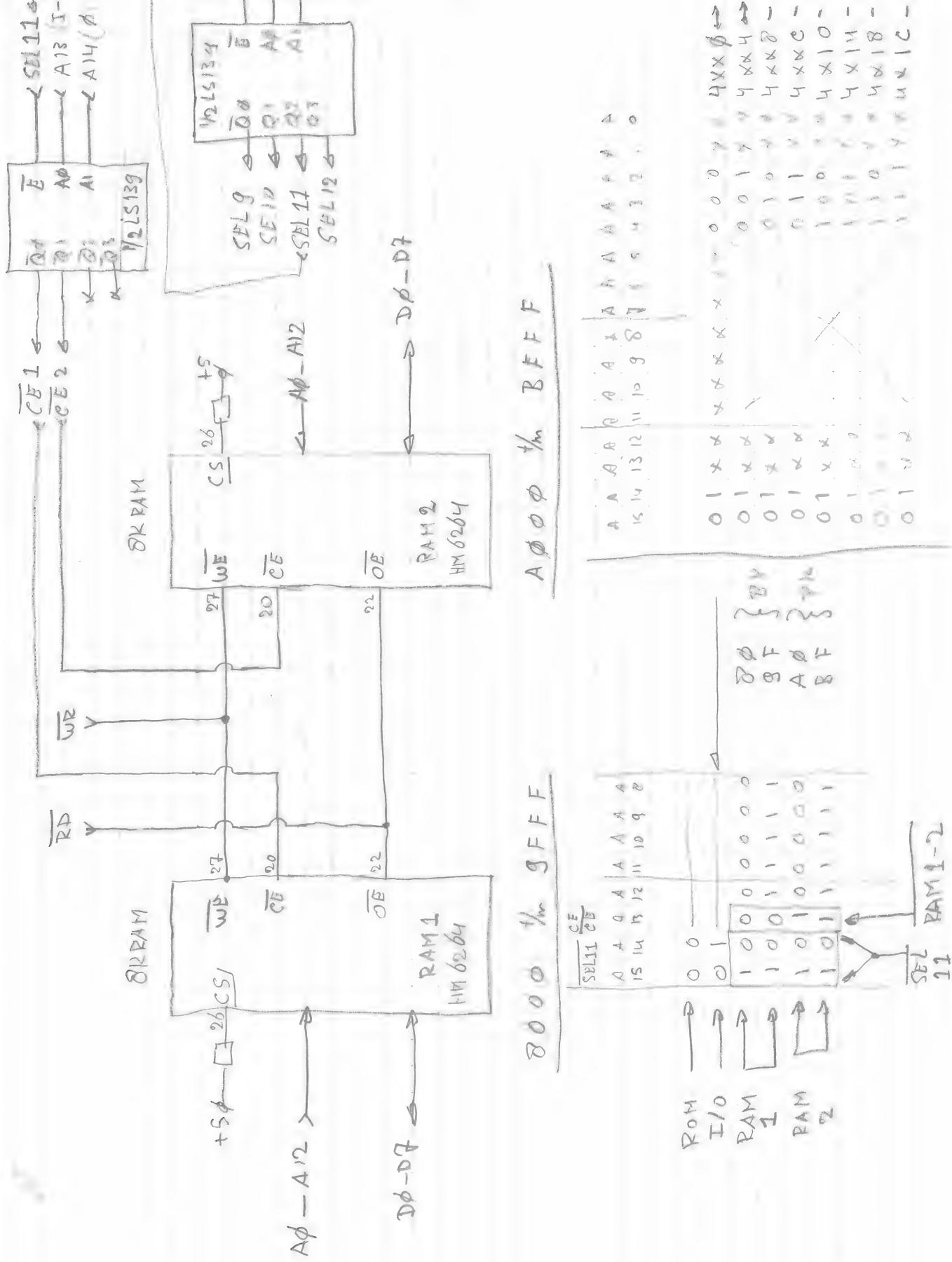


LS132

LS130

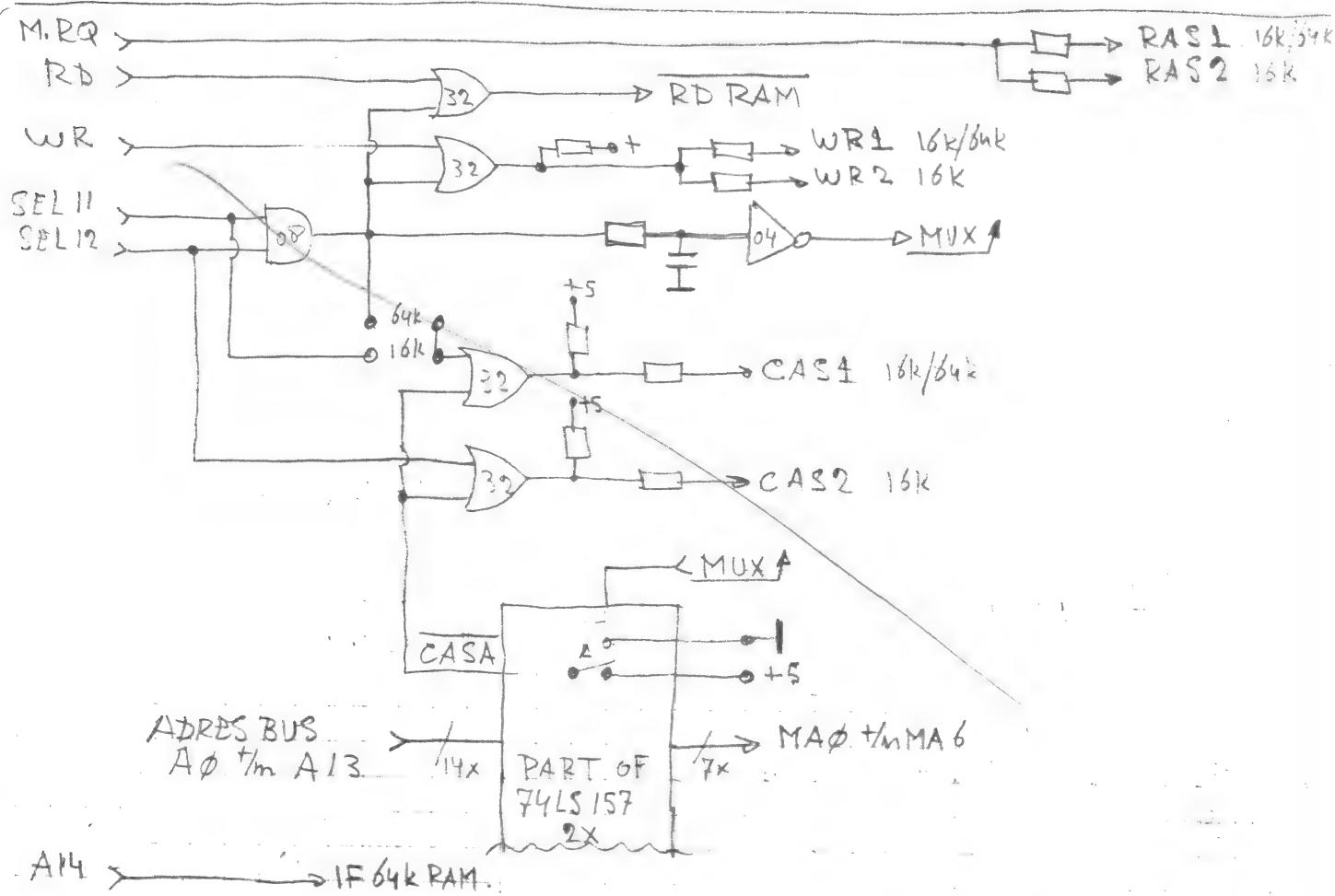
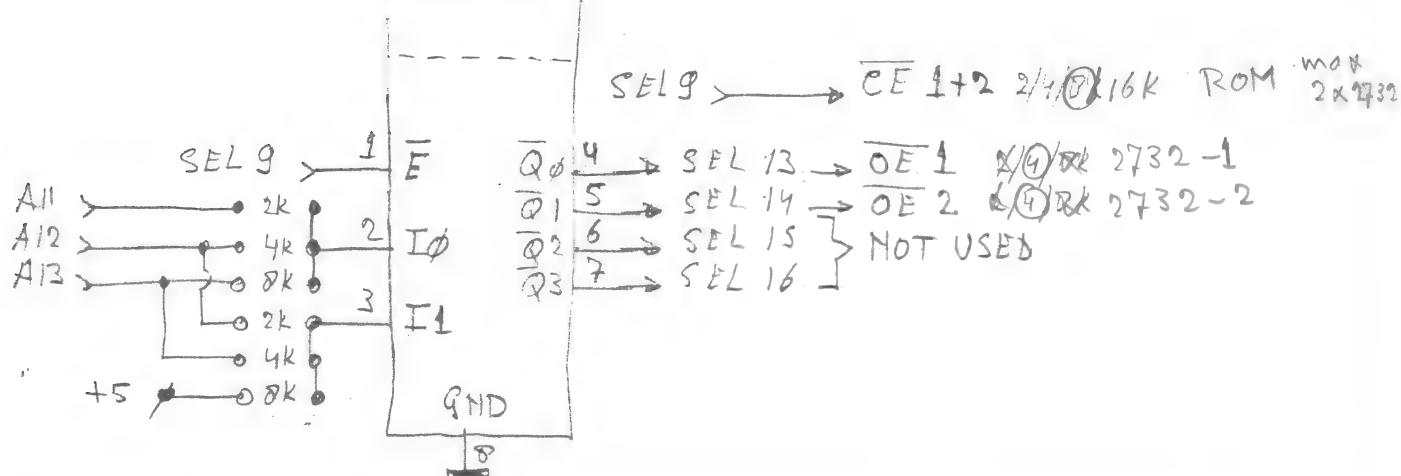
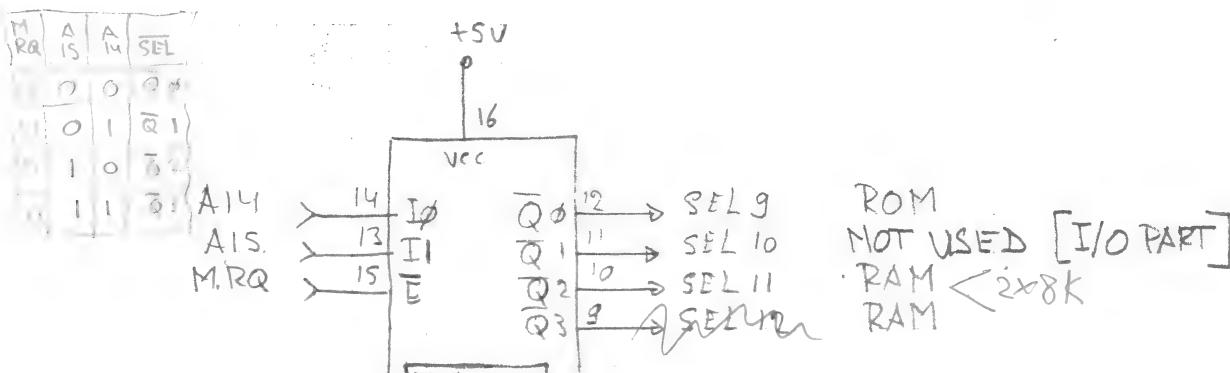
LS139

ROM	0 0 0 0	-	1 F F F	8K	-	S E L 9	(RD only)
I/O	4 x x 0	-	4 x x 3	LATCH 1	74LS374	S E L 1	(WR only)
	4 x x 4	-	4 x x 7	LATCH 2	74LS374	S E L 2	(WR only)
	4 x x 8	-	4 x x B	status	74LS244	S E L 3	(RD only)
	4 x x C	-	4 x x F				
	4 x 1 0	-	4 x 1 3	Control I/O	8255	S E L 5	(RD+WR)
	4 x 1 4	-	4 x 1 7	PAR. Input.	8255	S E L 6	(RD+WR)
	4 x 1 8	-	4 x 1 B				
	4 x 1 C	-	4 x 1 F				
RAM.	8 0 0 0	-	9 F F F	8K			(RD+WR)
RAM.	A 0 0 0	-	B F F F	8K			(RD+WR)



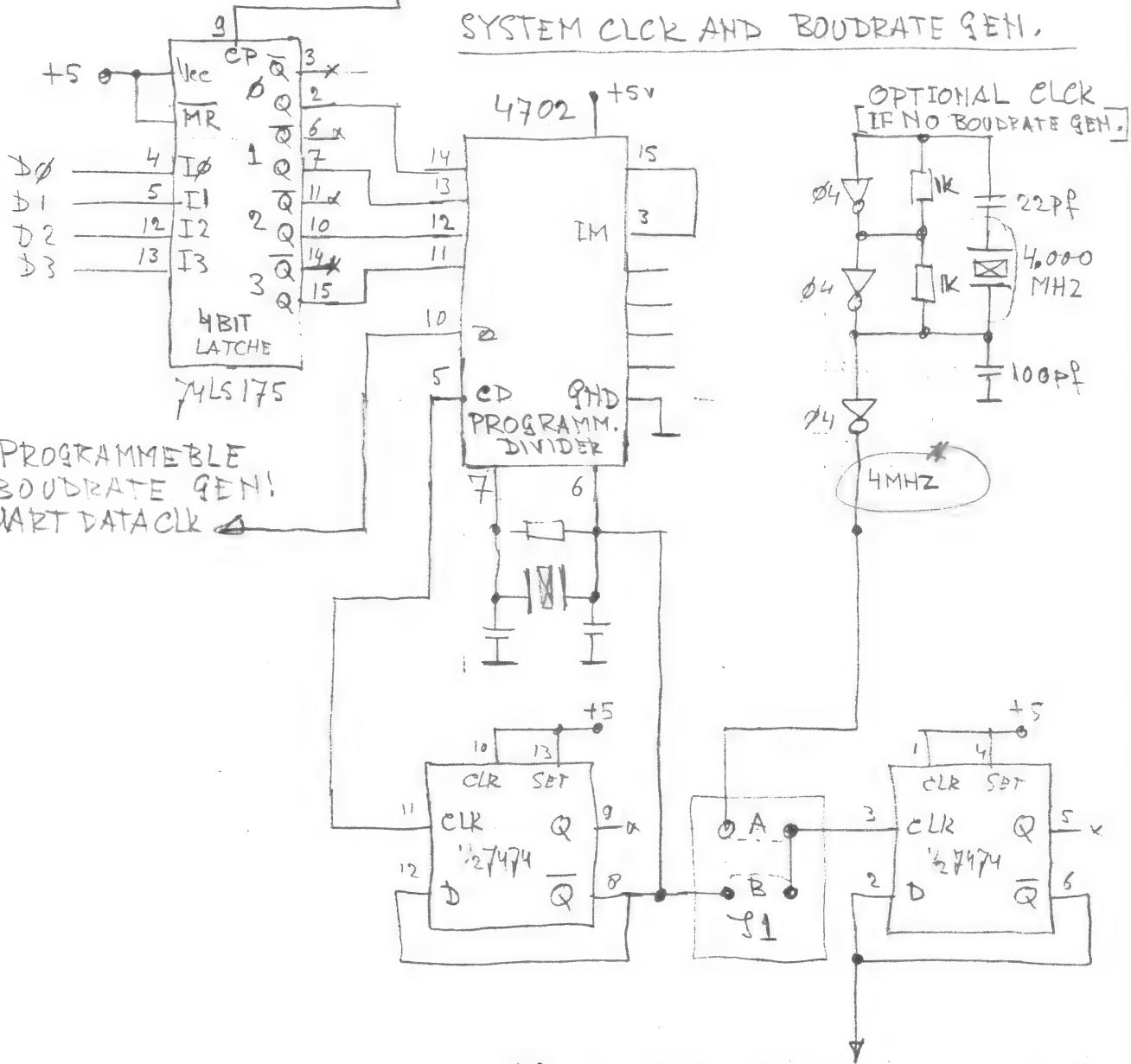
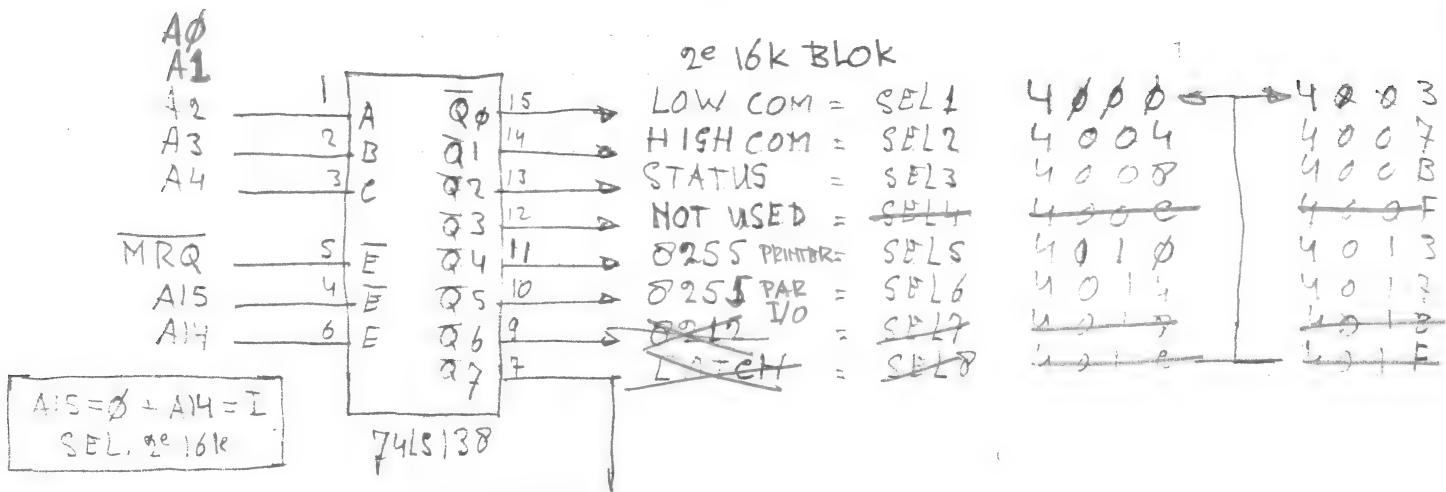
ROM + RAM DECODING

HCT 300



I/o DECODING

Hect 300



T34A = 2MHz SYSTEM elek ca 2MHz.

PIB = ... MHz SYSTEM CLK
AND UART DATA CLK

Double keyboard cable mapping + 12

+5v
gnd

12
18/17/19

- shift

- -

- poshole pulse
- ? - 14

- ? - 1

- D6 - 10
- D5 - 15

- D5 - 11
- D6 - 10

- star ctrl Ray
- D6 - 6

- D1 - 7
- D2 - 8

- D#3 - 9
- D#4 - 6

- NC - 2
- NC - 1

- gnd - 18/19
- gnd - 2

- gnd - 1
- gnd - 1

- -

20 - 9 RPT
16 - 8F (pulsars)

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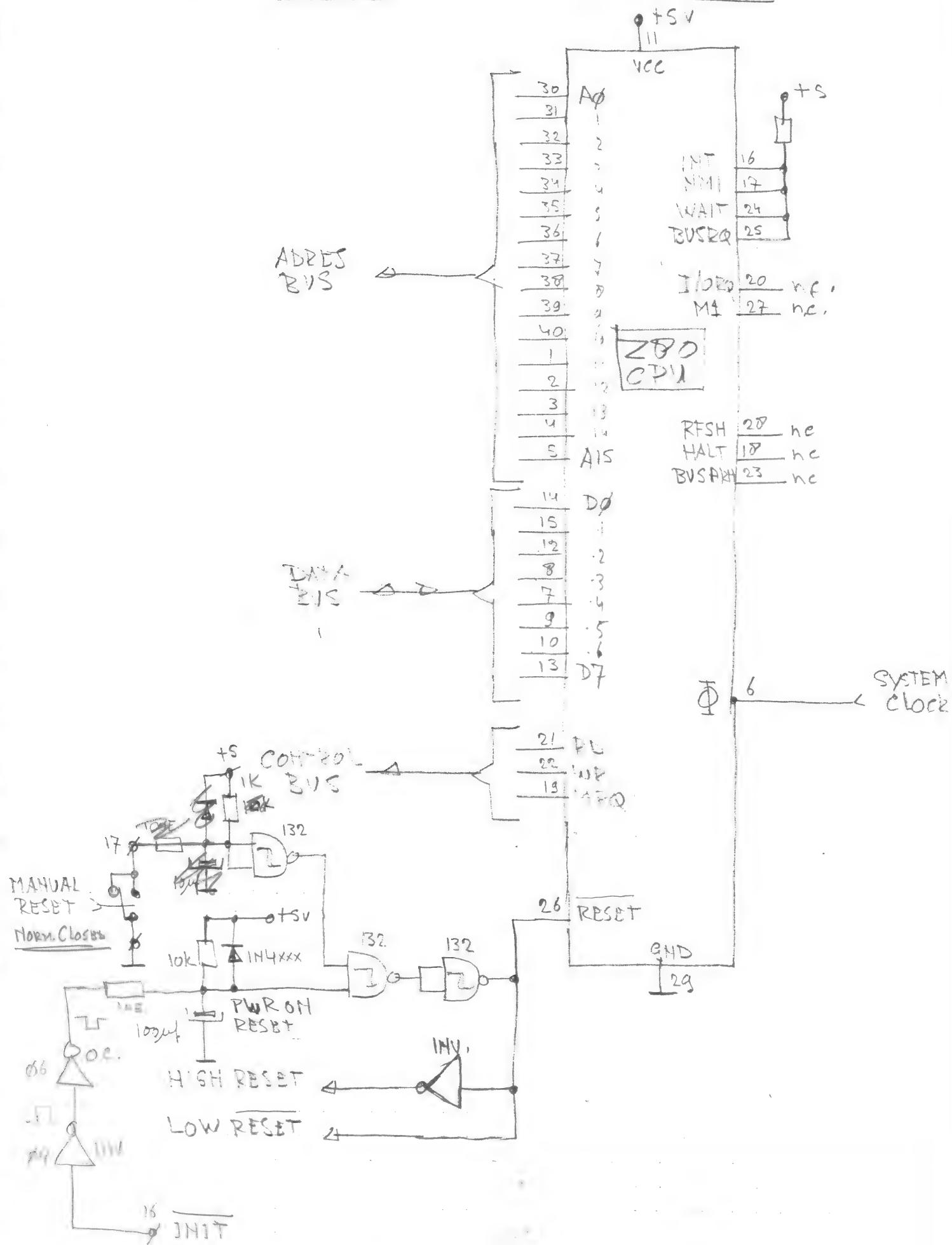
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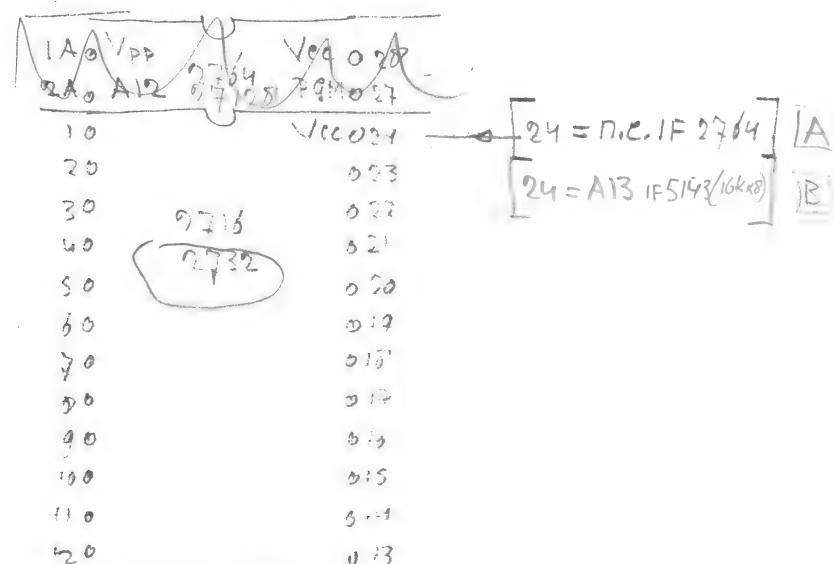
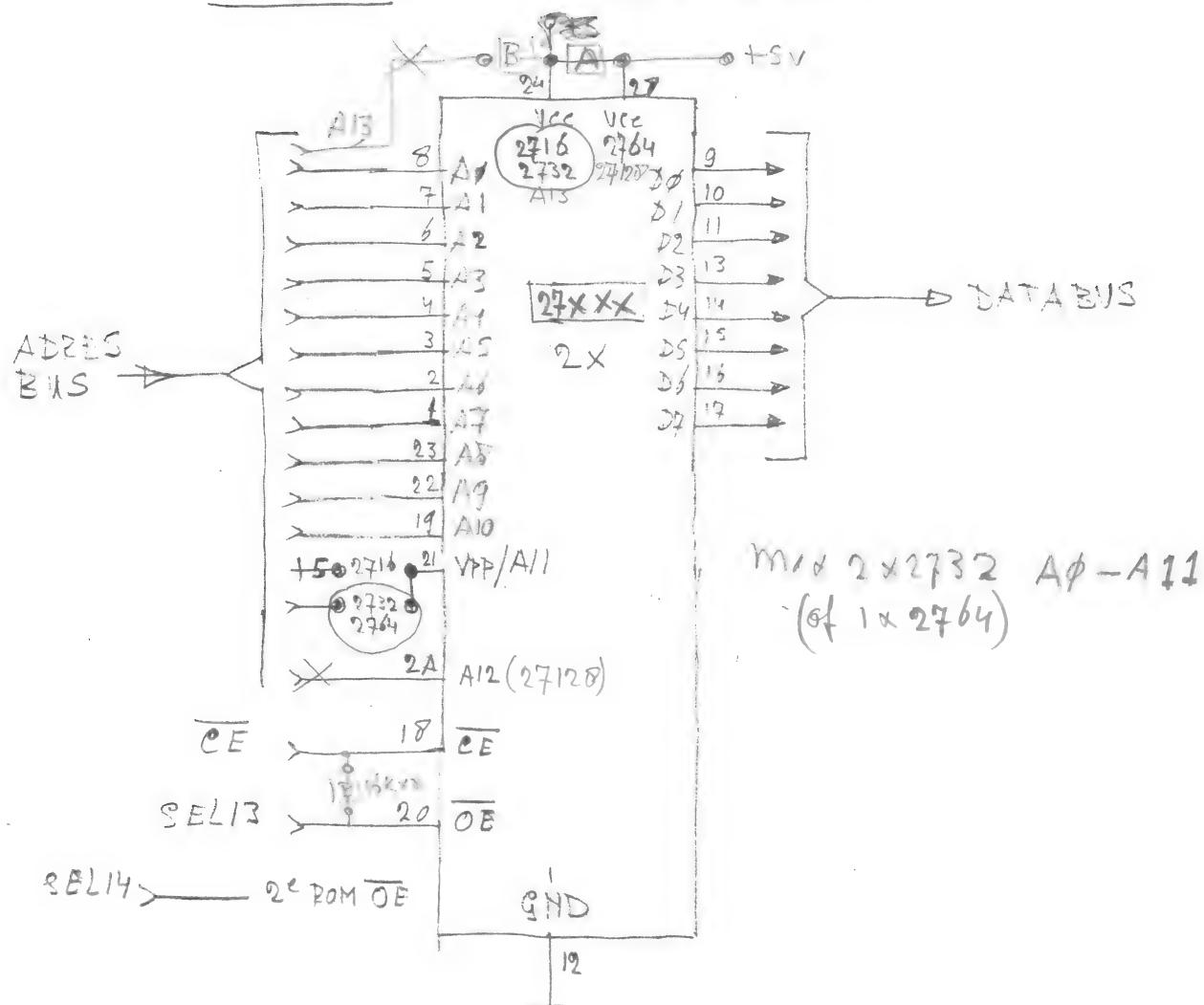
Z80-CPU

HCT 300

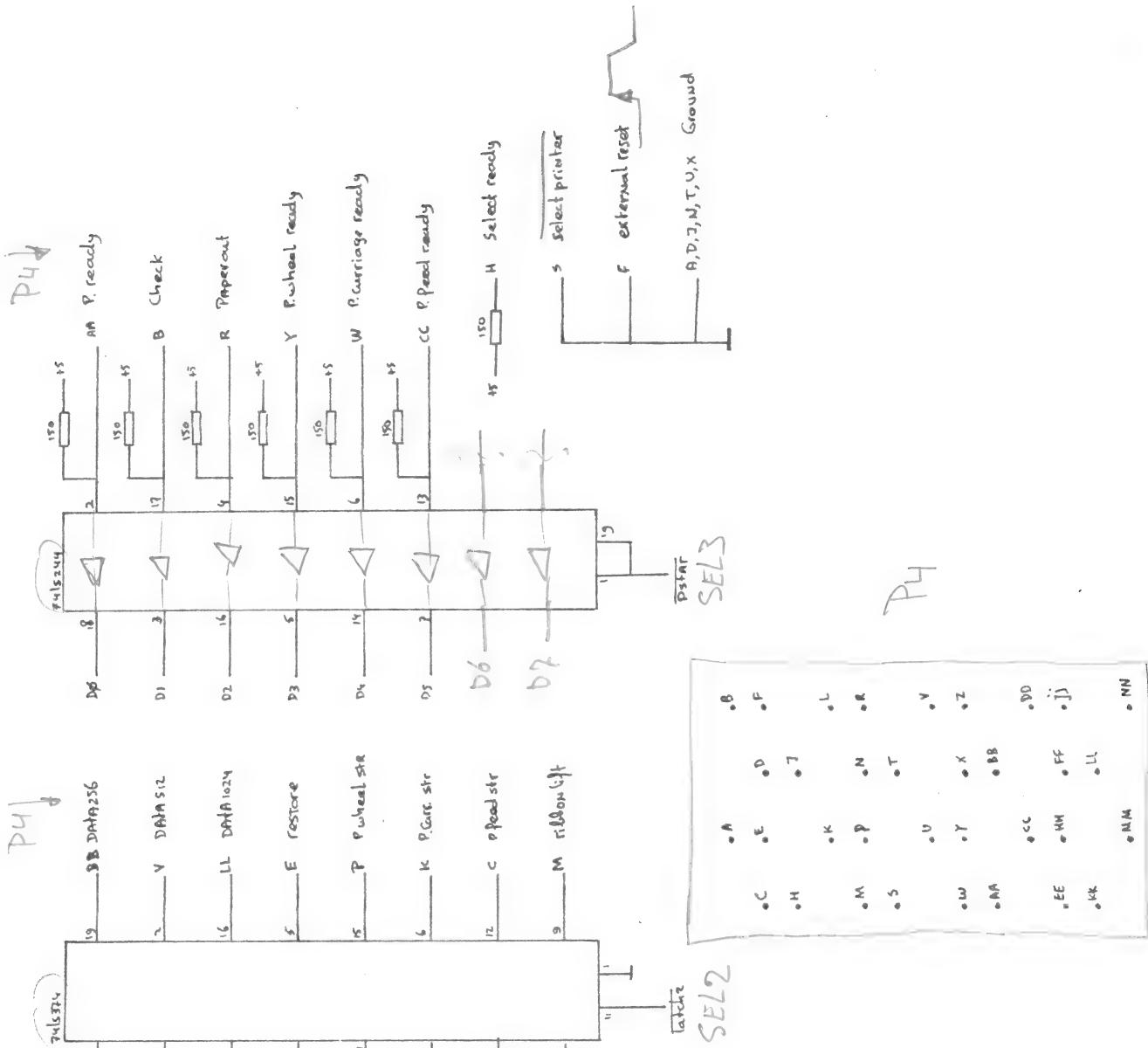
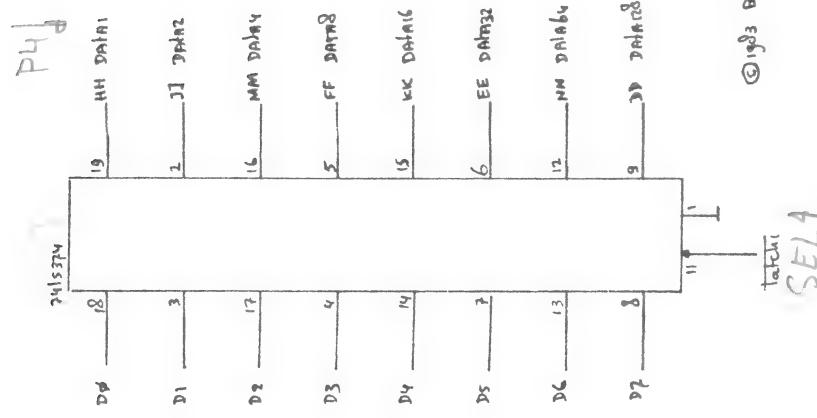


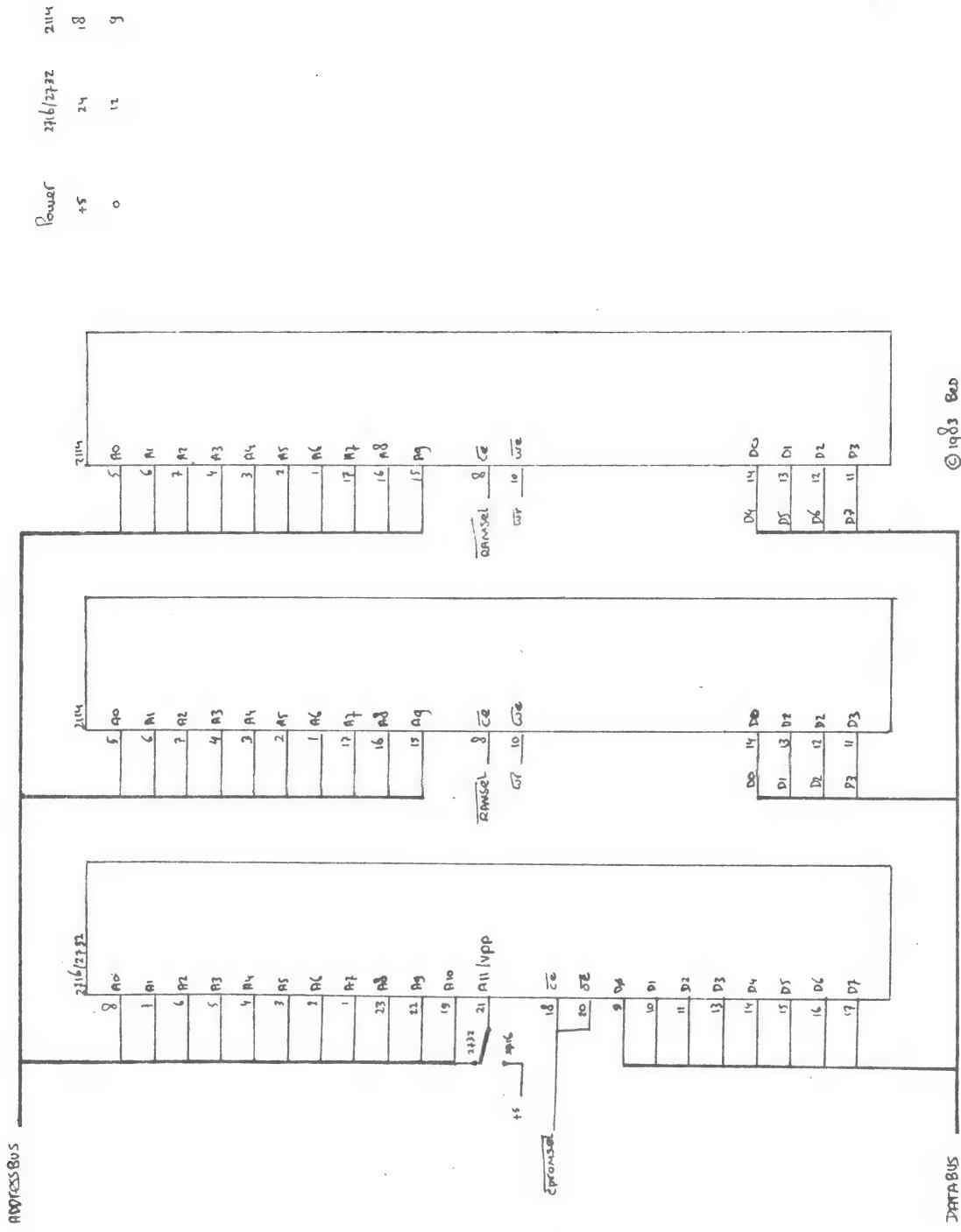
EPROM.

HCT 300

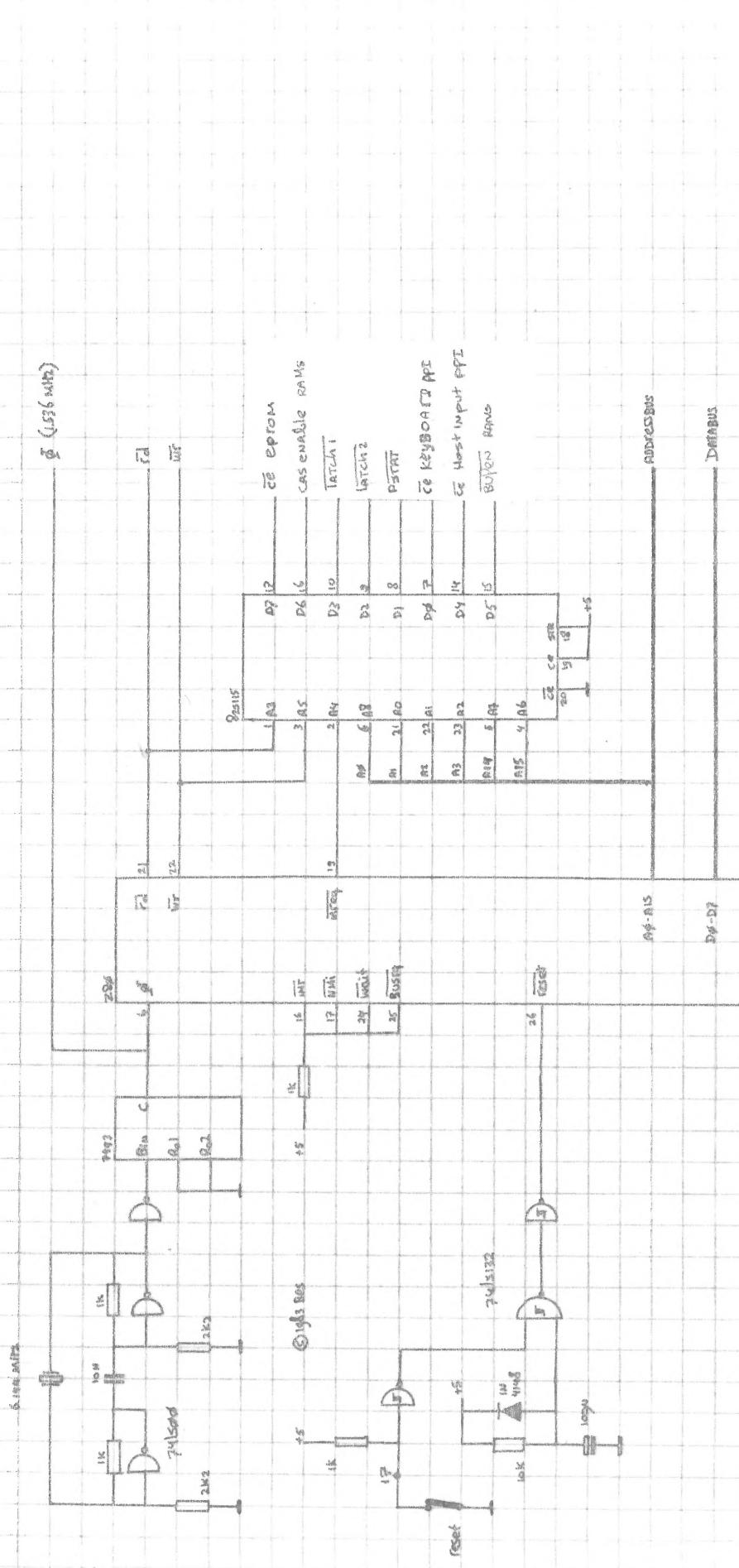


I/O LATCHES CONTR. BUFF. HET 300

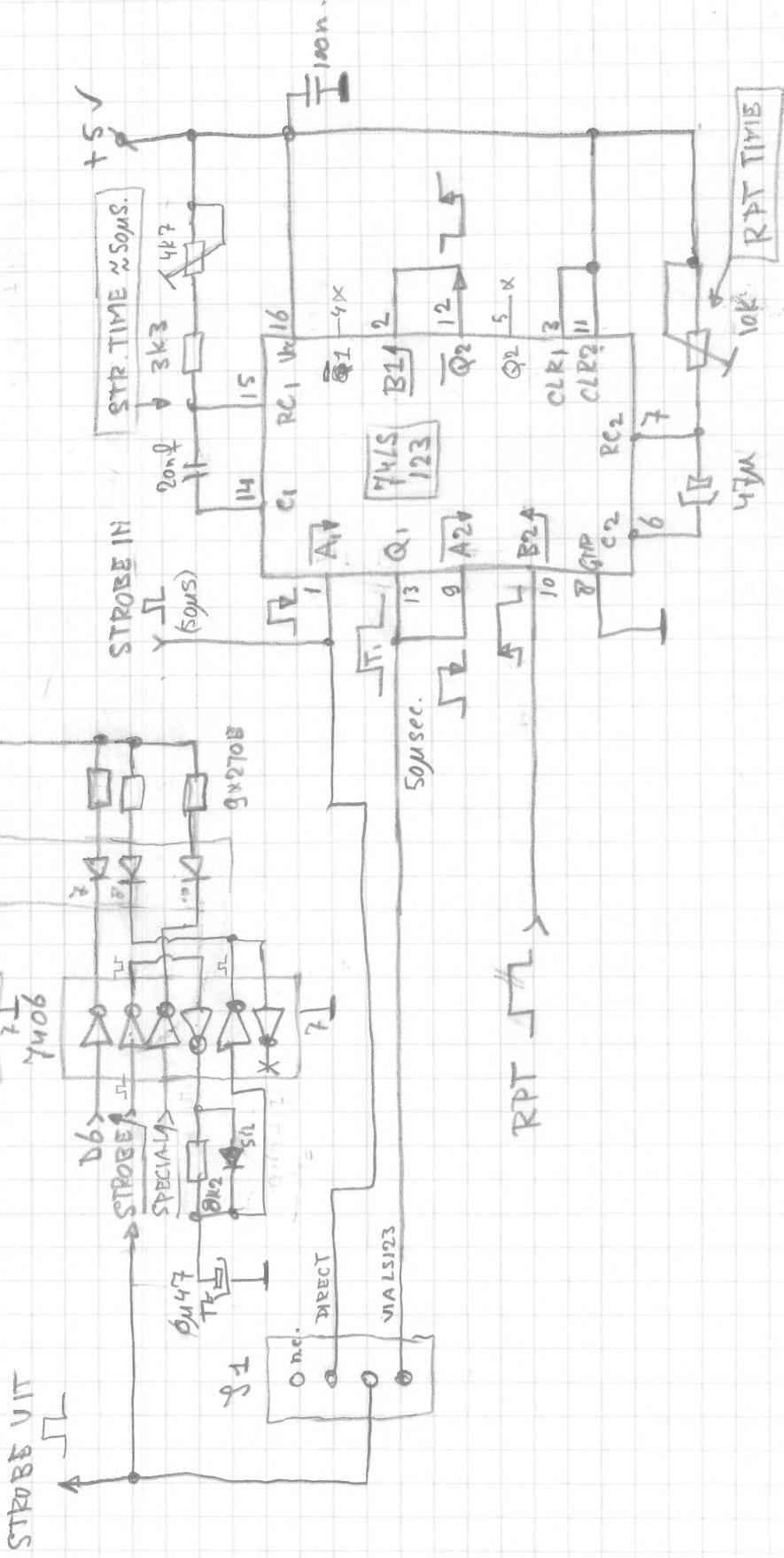
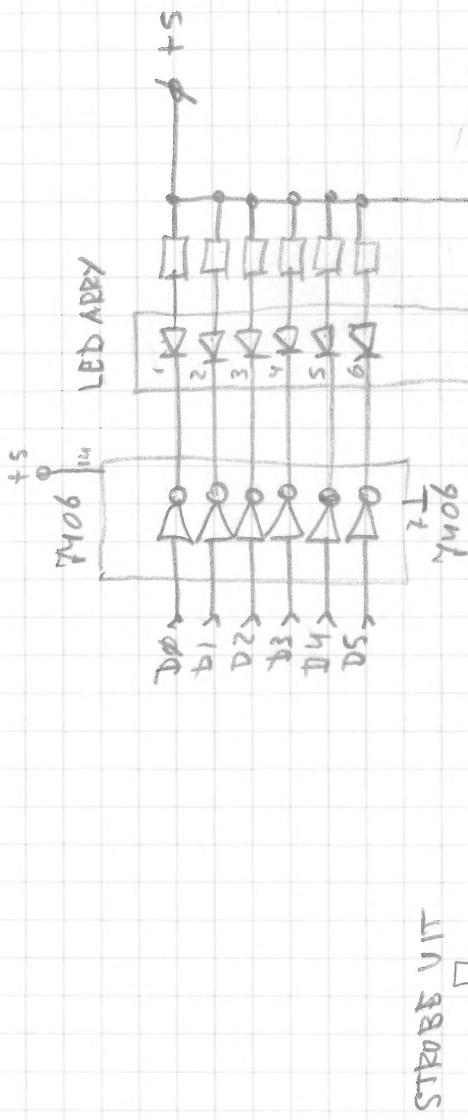




cpu section



KEYBOARD MONITOR + RPT.



DIABLO MONITOR + RPT.

SEODDEERZLDE

15123

1504

154

LBB 196

Diagram of a 7474 dual D flip-flop circuit and its timing diagram.

Circuit Components:

- 7408 AND gate (2 inputs, 1 output)
- 7402 OR gate (2 inputs, 1 output)
- NOT gate (Inverter)
- Diodes (represented by triangles)

Timing Diagram Labels:

- KEY
- STROBE
- OUTPUT
- Q

Timing Diagram Notes:

- STROBE: High for 1 μ s
- KEY: High for 270 ns
- Q: High for 50% of the time when STROBE is high

Via n. o
nr. A ols
PAIRS

